

J. H. DENNEDY.
COMPRESSOR.
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1,407,518.

Patented Feb. 21, 1922.

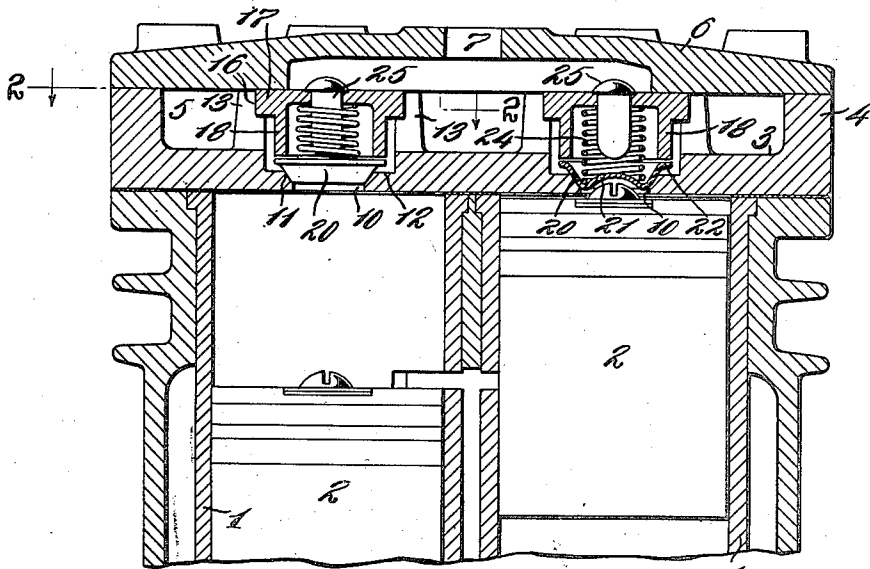


Fig. 1

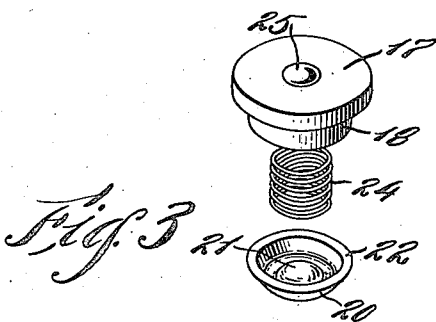


Fig. 3

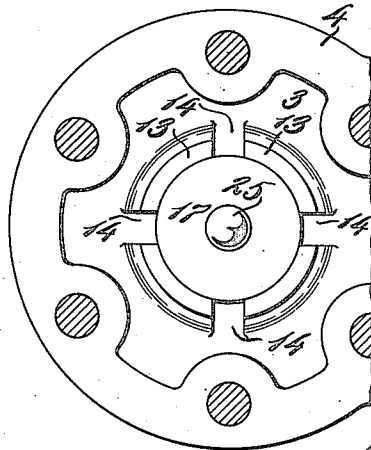
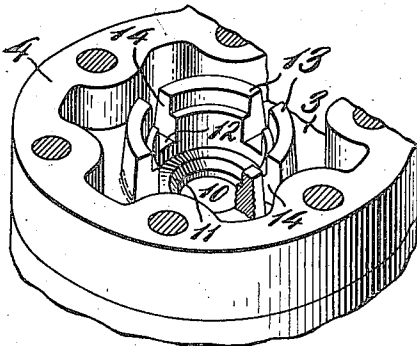


Fig. 2



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UNITED STATES PATENT OFFICE.

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COMPRESSOR.

1,407,518.

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To all whom it may concern:

Be it known that I, JAMES H. DENNEDY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a certain new and useful Improvement in Compressors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 This invention relates to compressors for expansible fluids and has special reference to those employed in connection with refrigerating apparatus although not restricted to that use. The objects of the invention
15 are the provision of a new, improved, and simplified compressor-valve which shall be lighter in weight and quieter in action than those heretofore employed; that can be made and assembled more cheaply than the usual
20 type of valve; which shall remain tight longer than other valves; which is interchangeable and can be assembled without grinding or special fitting; and which is guided and seated according to a new principle; while further objects and advantages
25 will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have illustrated one embodiment of my invention although it will be understood that my inventive idea can be embodied in numerous other physical structures. Fig. 1 is a vertical sectional view of a typical compressor
30 illustrating the construction and mode of operation of my improved valve; Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1; and Fig. 3 is a perspective view of the parts shown in Fig. 2 showing the
35 same in separated relation.

Describing the parts by reference characters, 1—1 represent the cylinders which may be of any desired size, number or arrangement, and 2—2 the pistons. Hermetically secured over the open ends of these
45 cylinders is the closure plate 3 which is formed with a marginal upturned wall 4 defining a chamber 5, said chamber being closed on its upper side by the cap 6 having therein the outlet opening 7. Formed in the
50 plate 3 in registry with each cylinder is an aperture 10 surrounded by a sloping seat 11 which in turn merges with the counterbore 12; and formed on the upper surface of the
55 plate 3 around this counterbore are the

spaced upstanding fingers 13 each of which is spaced from its neighbors to provide ports 14. The upper ends of these fingers terminate in close juxtaposition to the cap 6 and are formed interiorly with the cylindrical
60 rabbet 16 in which is seated the base flange 17 of a cylindrical cup 18 whose mouth depends into the counterbore 12. Located in the seat 11 is the valve member which consists of a hollow, sheet-metal stamping having
65 a frusto-conical side 20 terminating at its base in the outstanding flange 22 which projects loosely into the space between the mouth of the cup and the bottom of the counterbore whereby the movement of the
70 valve is limited. Interposed between the bottom of the cup and the upper face of the valve is the coil spring 24, here shown as retained in place by a pin 25 inset in the cup bottom, and by a projection or boss 21
75 formed in the valve.

The hollow in the valve which this spring engages is located beyond the plane of the valve seat so that the seating effect of the spring is not a push but a pull; tilting of the
80 valve is prevented both by the shape of the seat and also by the proximity of the retaining member 18. It will be understood that the latter need not comprise an unbroken cylindrical wall, but separate fingers
85 are equally effective provided they are so located as to define its equivalent.

Experience shows that this type of valve can be made much more cheaply and installed more conveniently, than the usual
90 type of poppet valve, also that it retains its tightness longer and operates with less noise; however I do not restrict myself to any of the structural features illustrated herein except as specifically set forth in the
95 annexed claims.

Having thus described my invention, what I claim is:

1. In a compressor, an outlet valve comprising a tapered, outwardly facing seat, a
100 movable valve member located on said seat and consisting of a circular, hollow, sheet-metal disk having tapered sides, a retaining member overlying said valve member and adapted to limit its displacement, and spring
105 means located beneath said retaining member and engaging said valve member.

2. In a compressor, an outlet valve comprising a tapered outwardly facing seat, a
movable valve member located on said seat 110

and comprising a hollow sheet-metal thimble having slanting sides which engage the seat and terminate in a circular lip, a retaining member mounted above and concentric with said valve and having a depending cylindrical portion whose lip cooperates with said first lip to limit the lift of the valve, and spring means interposed between said retaining member and valve member for seating the latter.

3. In a compressor, an outlet valve comprising a tapered outwardly facing seat, a movable valve member located on said seat and comprising a hollow sheet metal thimble having slanting sides which engage the seat and terminate in a circular lip, a retaining member mounted above and concentric with said valve and having a portion parallel to and spaced from said valve seat and overhanging said lip, and a spiral spring engaging the apex portion of said hollow valve.

4. In a compressor, an outlet valve comprising a tapered outwardly facing seat and a valve member consisting of a hollow thimble having tapered walls adapted to engage said seat, the hollow interior portion of the thimble extending beyond the seating portion thereof, and spring means operatively engaging the bottom of said hollow portion and tending to seat said valve member.

5. In a compressor, an outlet valve comprising an outwardly facing tapered seat and a stemless tapered disk adapted to engage the same, said disk being interiorly hollowed out to a point beyond its seating portion, and spring means located upon the outward side of said seat and operatively engaging the valve disk at the bottom of its recess.

6. In a compressor, an outlet valve comprising an outwardly facing tapered seat and a stemless tapered disk adapted to engage the same, said disk being exteriorly hollowed out to a point beyond its seating portion, and spring means located upon the outward side of said seat and operatively engaging the valve disk at the bottom of its recess, in combination with a retaining member which overlies the marginal portion of said disk and presents the double function of limiting its lift and preventing its tilting.

7. In a compressor, an outlet valve comprising a tapered outwardly facing seat surrounded by a counterbore, a valve member comprising a metal disk having a tapered portion to engage said seat and an outwardly projecting flange located at the base of said tapered portion and positioned in said counterbore, a retaining member located outside of and concentric with said valve seat

and having a portion extending into close relation with the outer face of said flange, and spring means engaging valve member whereby the latter is seated.

8. In a compressor, a closure plate having a peripheral wall and an outlet port spaced from said wall, said port being surrounded by a valve seat, and said valve seat being surrounded by a plurality of outwardly extending spaced fingers, a valve member operatively engaging said seat, a retaining member secured to said fingers and overlying the valve member, and a spring interposed between the retaining member and valve member.

9. In a compressor, a closure plate having a chamber, an outlet port communicating with said chamber, said port being surrounded by a valve seat and said valve seat being surrounded by a plurality of outwardly extending spaced fingers, a valve member operatively engaging said seat, a retaining member secured to said fingers and overlying the valve member, and a spring for seating said valve member.

10. In a compressor, a cylinder-head closure-plate having a port for each cylinder and having a marginal upstanding flange defining a chamber into which said ports open, a cap secured to the top of said flange and closing said chamber, a plurality of spaced upstanding fingers surrounding each port, there being a seating portion around each port inside the space defined by said fingers and the outer portion of said fingers being rabbeted, a valve member engaging each of said seats, a spring for each valve member, and a retaining member located in line with each port with its outer walls engaging said fingers, its top engaged by said cap and its bottom portion projecting into operative relation with said valve member.

11. In an outlet valve for compressors, in combination, a stemless hollow frusto-conical disk, a retaining member having a cylindrical portion presented towards the base of said disk and spaced slightly therefrom, and a closing spring interposed between said retaining member and valve member and seated in the bottom of the hollow of said valve member.

12. An outlet valve member for compressors consisting of a stemless hollow frusto-conical sheet metal thimble terminating in a narrow outwardly projecting flange at the base of the sloping portion.

In testimony whereof, I hereunto affix my signature.

JAMES H. DENNEDY.